



## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No. FAA-2022-0056; Special Conditions No. 25-806-SC]

#### Special Conditions: Peregrine; Installed Rechargeable Lithium Batteries

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for a supplemental type certificate to install rechargeable lithium batteries in the Emergency Exit Light (EEL) power supply on certain transport category airplanes. These airplanes, as modified by Peregrine, will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. This design feature is the installation of an EEL power supply that contains rechargeable lithium batteries. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**DATES:** This action is effective on Peregrine on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Send comments on or before [INSERT DATE 45 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** Send comments identified by Docket No. FAA-2022-0056 using any of the following methods:

- *Federal eRegulations Portal:* Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.

- *Mail:* Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202-493-2251.

*Privacy:* Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received without change to <http://www.regulations.gov/>, including any personal information you provide. The FAA will also post a report summarizing each substantive verbal contact received about this proposal.

*Confidential Business Information:* Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this Notice contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this Notice, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and the indicated comments will not be placed in the public docket of this Notice. Submissions containing CBI should be sent to Nazih Khaouly, Aircraft Systems, AIR-623, Technical Innovation Policy Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, Washington 98198; telephone and fax

206-231-3160; e-mail [nazih.khaouly@faa.gov](mailto:nazih.khaouly@faa.gov). Comments the FAA receives, which are not specifically designated as CBI, will be placed in the public docket for this rulemaking.

*Docket:* Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Nazih Khaouly, Aircraft Systems, AIR-623, Technical Innovation Policy Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, Washington 98198; telephone and fax 206 231 3160; e mail [nazih.khaouly@faa.gov](mailto:nazih.khaouly@faa.gov)

**SUPPLEMENTARY INFORMATION:**

The substance of these special conditions has been published in the *Federal Register* for public comment in several prior instances with no substantive comments received. Therefore, the FAA has determined that prior public notice and comment are unnecessary, and finds that, for the same reason, good cause exists for adopting these special conditions upon publication in the *Federal Register*.

**Comments Invited**

The FAA invites interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

The FAA will consider all comments received by the closing date for comments. The FAA may change these special conditions based on the comments received.

## **Background**

On January 22, 2021, Peregrine applied for a supplemental type certificate to install rechargeable lithium batteries in the ELL power supply. Peregrine wants to apply this STC to multiple transport category airplanes and may periodically amend this STC to expand its applicability to include additional transport category airplane makes and models.

## **Type Certification Basis**

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.101, Peregrine must show that airplanes, for which they make application to modify by STC no. ST01086DE, as changed, continue to meet the applicable provisions of the regulations listed in each airplane's respective type certificate or the applicable regulations in effect on the date of application for the change except for earlier amendments as agreed upon by the FAA.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the airplane model for which they are issued. Should the applicant apply for an STC to modify any other model included on the same type certificate to incorporate the same novel or unusual design feature, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the airplanes modified by STC no. ST01086DE must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.101

### **Novel or Unusual Design Features**

The airplanes with STC no. ST01086DE will incorporate the following novel or unusual design feature:

The installation of an EEL power supply that contains rechargeable lithium batteries.

### **Discussion**

Rechargeable lithium batteries are considered to be a novel or unusual design feature in transport category airplanes, with respect to the requirements in § 25.1353. This type of battery has certain failure, operational, and maintenance characteristics that differ significantly from those of the nickel-cadmium and lead-acid rechargeable batteries currently approved for installation on transport category airplanes. These batteries introduce higher energy levels into airplane systems through new chemical compositions in various battery-cell sizes and construction. Interconnection of these cells in battery packs introduces failure modes that require unique design considerations, such as provisions for thermal management.

Special Condition 1 requires that each individual cell within a battery be designed to maintain safe temperatures and pressures. Special Condition 2 addresses these same issues but for the entire battery. Special Condition 2 requires that the battery be designed to prevent propagation of a thermal event, such as self-sustained, uncontrolled increases in temperature or pressure from one cell to adjacent cells.

Special Conditions 1 and 2 are intended to ensure that the cells and battery are designed to eliminate the potential for uncontrollable failures. However, a certain number of failures will occur due to various factors beyond the control of the designer. Therefore,

other special conditions are intended to protect the airplane and its occupants if failure occurs.

Special Conditions 3, 7, and 8 are self-explanatory. Special Condition 4 clarifies that the flammable-fluid fire-protection requirements of § 25.863 apply to rechargeable lithium battery installations. Section 25.863 is applicable to areas of the airplane that could be exposed to flammable fluid leakage from airplane systems. Rechargeable lithium batteries contain electrolyte that is a flammable fluid.

Special Condition 5 requires each rechargeable lithium battery installation to not damage surrounding structure or adjacent systems, equipment, or electrical wiring from corrosive fluids or gases that may escape in such a way as to cause a major or more severe failure condition. Special Condition 6 requires each rechargeable lithium battery installation to have provisions to prevent any hazardous effect on airplane structure or systems caused by the maximum amount of heat it can generate due to any failure of it or its individual cells. The means of meeting special conditions 5 and 6 may be the same, but they are independent requirements addressing different hazards. Special Condition 5 addresses corrosive fluids and gases, whereas special condition 6 addresses heat.

Special Condition 9 requires rechargeable lithium batteries to have “automatic” means, for charge rate and disconnect, due to the fast-acting nature of lithium battery chemical reactions. Manual intervention would not be timely or effective in mitigating the hazards associated with these batteries.

These special conditions apply to all rechargeable lithium battery installations in lieu of § 25.1353(b)(1) through (4) at Amendment 25-123 or § 25.1353(c)(1) through (4) at earlier amendments. Those regulations remain in effect for other battery installations.

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

## **Applicability**

As discussed above, these special conditions are applicable to the airplane models listed on the approved model list (AML) of STC no. ST01086DE, which is available at [rgl.faa.gov](http://rgl.faa.gov). All models listed in the AML must be evaluated and determined to comply with these special conditions. Additionally each new model added to the AML subsequently must also be evaluated and determined to comply with these special conditions. Should Peregrine apply at a later date for a change to STC no. ST01086DE to include any other model on the AML to incorporate the same novel or unusual design feature, these special conditions would apply to that model as well. Should Peregrine apply at a later date for another STC to modify any other model included on the type certificates of the models on the STC no. ST01086DE AML to incorporate the same novel or unusual design feature, these special conditions would also apply to that model as well. These special conditions are not applicable to those models in which special conditions for rechargeable lithium batteries have already been issued against the Type Certificate for that specific model.

## **Conclusion**

This action only affects the installation of an EEL power supply that contains rechargeable lithium batteries on the airplane models listed on the AML of STC no. ST01086DE. It is not a rule of general applicability and affects only the applicant who will apply to the FAA for approval of these features on the airplanes.

## **List of Subjects in 14 CFR Part 25**

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

## **Authority Citation**

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(f), 106(g), 40113, 44701, 44702, 44704.

## **The Special Conditions**

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for airplane models listed on the approved model list of supplemental type certificate no.

ST01086DE, as modified by Peregrine.

In lieu of § 25.1353(b)(1) through (4) at amendment 25-123, or § 25.1353(c)(1) through (4) at earlier amendments, each rechargeable lithium battery installation must:

1. Be designed to maintain safe cell temperatures and pressures under all foreseeable operating conditions to prevent fire and explosion.
2. Be designed to prevent the occurrence of self-sustaining, uncontrollable increases in temperature or pressure, and automatically control the charge rate of each cell to protect against adverse operating conditions, such as cell imbalance, back charging, overcharging and overheating.
3. Not emit explosive or toxic gases, either in normal operation or as a result of its failure that may accumulate in hazardous quantities within the airplane.
4. Meet the requirements of § 25.863.
5. Not damage surrounding structure or adjacent systems, equipment, or electrical wiring from corrosive fluids or gases that may escape in such a way as to cause a major or more-severe failure condition.
6. Have provisions to prevent any hazardous effect on airplane structure or systems caused by the maximum amount of heat it can generate due to any failure of it or its individual cells.
7. Have a failure sensing and warning system to alert the flight crew if its failure affects safe operation of the airplane.



8. Have a monitoring and warning feature that alerts the flightcrew when its charge state falls below acceptable levels if its function is required for safe operation of the airplane.
9. Have a means to automatically disconnect from its charging source in the event of an over-temperature condition, cell failure or battery failure.

Note: A battery system consists of the battery, battery charger, and any protective monitoring and alerting circuitry or hardware inside or outside of the battery. It also includes vents (where necessary) and packaging. For the purpose of these special conditions, a battery and the battery system is referred to as a battery.

Issued in Kansas City, Missouri, on January 20, 2022.

Patrick R. Mullen,  
Manager, Technical Innovation Policy Branch,  
Policy and Innovation Division,  
Aircraft Certification Service.

[FR Doc. 2022-01443 Filed: 1/25/2022 8:45 am; Publication Date: 1/26/2022]